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ON THE SURGICAL TREATMENT OF

DISEASES OF THE STOMACH

FROM A PHYSICIAN'S POINT OF VIEW

BY

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ON THE SURGICAL TREATMENT OF DISEASES OF THE STOMACH FROM A PHYSICIAN'S POINT OF VIEW.[1]

THERE is no subject of greater interest to the general physician than that concerning the surgical treatment of the diseases of the stomach with which he is called upon to deal and in my opinion there is no department of the surgeon's art which has made greater strides within recent years. The comparative safety with which the stomach can be exposed and manipulated, the perfection of the technique with which the operations are carried out, and the relief which in many cases of gastric disease is afforded by surgical interference compel the physician to regard the surgery of the stomach as one of the therapeutic procedures which he must always take carefully into consideration in guiding the treatment of cases of gastric disease. The technique of the operations is, indeed, so perfect that on at least one occasion, some months after a laparotomy had been performed for cancer of the stomach, I have seen the abdomen opened on the post-mortem table without the pathologist having noticed the almost invisible cicatrix which was all that remained as evidence of the operation that had been performed. It is no wonder then that the surgeon is ready and willing to give the sufferer from organic disease of the stomach all the benefit that may be possible from the exercise of his art. This much, indeed, may be freely granted, and yet it must at the same time be admitted that the point of view of the physician in relation to this question is necessarily somewhat different from that of the surgeon. It is in the very nature of things that the physician sees more of the natural history of these diseases than the surgeon does. He sees them earlier (he is often blamed for not seeing them early enough) and he sees them later when the surgeon has done his best. The surgeon's interest perhaps tends to slacken when the wound is healed and the

[1] A paper read at a meeting of the Glasgow Northern Medical Society on Nov. 3rd, 1903.

patient is so far restored to the *status quo ante*. It then falls to the lot of the physician to watch the slow decay of the vital powers which accompanies the natural progress of the malady and to compare the course of the comparatively few cases which can be, and have been, operated upon with the much greater number of similar cases of disease in which no operation could ever have been possible. From this I think it follows that the physician's outlook on gastric operations, excepting those undertaken for ruptured gastric ulcer, and perhaps, though not certainly, those for simple dilatation of the viscus, is scarcely likely to be so hopeful as that of his surgical brother.

My own interest in the surgical treatment of gastric disease dates from an early period of my professional career. In 1892 I published[2] a paper on the surgical treatment of gastro-intestinal cancer from the point of view of a pathologist and based upon the post-mortem examination of 26 consecutive cases. The general conclusion I then arrived at was that the radical cure of gastric cancer by surgical means must always be rare chiefly on account of the great frequency with which secondary extensions undetectable by ordinary means of examination are present, 16 out of 19 cases of gastric cancer presenting on post-mortem examination secondary nodules in the liver or other parts. As the basis of my present study of the subject I have taken the facts recorded in my ward journals since 1895. In this period of eight years I find that there have been under treatment in my wards 220 cases of stomach disease of all kinds, 80 males and 140 females. Of these cases I find that surgical operation was recommended and performed in 23 and it is on a more particular study of the records of these 23 cases (an analysis of which is given below) that I found the remarks I have to make in this paper.

Cancer, 6 males, 7 females	13 cases.
Ulcer, all females	4 ,,
Hæmatemesis, all males	2 ,,
Simple dilatation, all males	3 ,,
Stricture of the œsophagus	1 case.
Total	23 cases.

Gastric Cancer.

Two methods of surgical treatment suggest themselves both to the physician and the surgeon as applicable to cases of cancer of the stomach: (1) pylorectomy, the radical removal of the tumour itself; and (2) gastro-enterostomy, a palliative procedure for the relief of urgent and distressing symptoms.

1. As regards pylorectomy, I have already referred to my views of the value of this operation as based upon post-

[2] Brit. Med. Jour., April 23rd, 1892.

mortem room experience. After a somewhat careful consideration of a series of consecutive cases examined post mortem I came clearly to the opinion that in the present state of our diagnosis pylorectomy could seldom be undertaken with any very great prospect of success. In this opinion I found myself in agreement with Guinard. My clinical experience of the last eight years rather strongly confirms me in this opinion. In only one of the 13 cases in which I recommended operation did I advise pylorectomy as the procedure which I thought might be hopefully undertaken, and in that case, though the conditions were in every sense most favourable, the operation could not be completed on account of the highly dangerous collapse of the patient on the operating table The man recovered from the operation well and died nearly two months later in my wards from the natural progress of his malady. In all the other cases I advised either an exploratory incision with a view to a possible radical operation or the performance of a gastro-enterostomy for the relief of urgent symptoms At this stage it may be right to state the results of the 13 operations for gastric cancer in a tabular form :—

Pylorectomy advised but found to be impossible	1 case (recovery).
Gastro-enterostomy advised but pylorectomy performed as the conditions seemed favourable when the abdomen was opened	2 cases (both died).
Exploratory operation advised and followed by—	
(a) Gastro-enterostomy	6 cases (5 recovered).
(b) Closing of the wound as nothing could be done	4 cases (3 recovered).

When we examine this table we are struck with one thing—namely, the comparative safety with which an exploratory incision for disease of the stomach can be made. In the whole series of 13 cases there were only four in which the death could be directly attributed to the operation. I regard a death occurring within 48 hours after the operation as probably due to it. Of these four deaths two were cases of pylorectomy, one followed an enterostomy, and one followed the closing of the wound when it was found that nothing could be done. What higher tribute to the success of the surgeon's art could be paid by a physician than such a table as I have given of the results of, perhaps, about the most trying operation to which the human frame could be subjected? Why is it then that pylorectomy for gastric cancer still remains such a fatal operation? I have witnessed the performance of the operation four times and in all the patients died. I cannot answer the question. The surgeon is apt to say that he does not get the cases early enough in the course of the disease and I think there may be a great deal of truth in this statement. But I do not think that it covers the whole

ground. It seems to me that the removal of a large portion of the stomach, especially when the organ is the seat of malignant disease, is accompanied by a degree of nervous shock which only a few constitutions are able to recover from. I am well aware of a number of brilliant successes, but I think they are still in the minority. As regards the question of the earliest time at which operation should be recommended I do not think that the physician can do much more than he does at present, unless, indeed, he is prepared to advise every case of chronic dyspepsia to submit to a laparotomy with a possible pylorectomy at the end of it. I for one am not yet prepared to recommend such a course. Our powers of diagnosis in the earliest stages of cancer of the stomach are not yet so perfect as to permit of this. As regards the 13 cases in which I advised operation there was no great difficulty in the diagnosis. In one what was thought to be a dilated gall-bladder turned out to be cancer of the stomach and liver. With this exception the diagnosis was clear in all the others. But this leads me to say that when the diagnosis is clear—i.e., when a tumour is palpable—the time for pylorectomy or radical operation is past. Here my clinical and my pathological experience agrees. When a gastric cancer is palpable the probability of the presence of secondary extension is very great; and in addition the vitality is likely to be so much reduced that the chances of recovery from a radical operation are very slight. In all such cases while I would not be inclined to advise pylorectomy I would not refuse the patient the slight chance it might afford him if I were quite convinced that he fully appreciated all the risks.

2. I propose now to consider very shortly the operation of gastro-enterostomy or gastro-jejunostomy in the treatment of gastric cancer. From the nature of the disease this operation can only be regarded as a palliative procedure. It is an operation to be recommended in cases where there is marked obstruction of the pylorus, leading to excessive pain and vomiting. Possibly the establishment of a gastro-enteric anastomosis might be regarded as likely to retard the growth of a malignant neoplasm of the stomach by preventing the irritation of the tumour by the passage of the gastric contents over its surface, but I think the probability of such a result is too remote to justify the recommendation of the operation on this ground alone. But for purposes of palliation I would not hesitate to recommend it in all suitable cases. In a recent letter to the medical press Mr. A. E. Maylard expressed his doubts as to whether it was right to advise gastro-enterostomy in advanced cases of pyloric cancer when we know that the relief can in the very nature of things only be temporary and when it is almost certain that after a period of marked relief and improvement the patient will have to go through all the suffering and distress again before the final event. There

is perhaps something to be said in favour of such an attitude, but I confess that I have not very much sympathy with it. It is, I think, the duty of the physician and the surgeon alike to afford relief from suffering and to prolong life whenever it is possible to do so and that without consideration of ulterior and it may be inevitable results. Of course, it should always be made clear to the patient that the procedure to be adopted is merely a temporary and palliative one.

In our series of 13 cases gastro-enterostomy was performed five times and enterostomy (jejunal fistula) once. In all of these cases—except that of enterostomy, in which the patient died soon after the operation—the relief afforded was most marked and the patients survived the operation for a period of from three weeks to three months, some of them being readmitted to my wards upon the complete healing of the surgical wound. Under the limitations indicated above there can be no doubt that gastro-enterostomy is a most valuable and justifiable procedure in gastric cancer and that the earlier it is performed—even before, it may be, marked emaciation and obstruction have taken place—the more successful is it likely to be. As regards the four remaining cases in which merely an exploratory operation was possible nothing more need be said. One of the patients died as the result of the operation, the others recovered from it and in the course of time succumbed to the disease.

In concluding this portion of my paper I may give a statement of the proportion of cases operated upon to the total number of cases of gastric cancer observed in the period dealt with. The total number of cases of cancer of the stomach treated was 39—viz., 23 males and 16 females. The total number of operations was 13—viz., 6 males and 7 females—i.e., operation was performed in 30 per cent. of the cases treated. In a number of other cases operation was offered but was refused by the patient after a full statement of all the possibilities had been made. The following summaries of these 13 cases are given in chronological order, the male cases first and the female cases second.

Epitome of Cases of Gastric Cancer.

CASE 1.—The patient, a blind man, aged 62 years, was admitted to Ward 7 of the Glasgow Royal Infirmary on Oct. 5th, 1895, complaining of loss of flesh, weakness, and anorexia of six months', and of hiccough and eructation of two months' duration. There was a nodular freely moveable mass palpable in the epigastrium which was decided to be pyloric in situation. No free hydrochloric acid was detected in the gastric contents. Laparotomy was performed on Oct. 25th, but pylorectomy was not proceeded with on account of dangerous collapse. The patient was readmitted, quite recovered from the operation, on Nov. 19th, 1895, and died on Dec. 16th

from exhaustion. A post-mortem examination revealed great narrowing and thickening of the pylorus from an epithelioma. No secondary nodules were present. The patient's blindness, which had been present from early youth, was found to be due to quiescent myxomatous tumour in the left lobe of the cerebellum.

CASE 2.—The patient, a man, aged 54 years, was admitted to Ward 7 on March 18th, 1898, on account of pain and vomiting after food of 14 days' duration. His stomach had troubled him since August, 1896, when he had a sudden hæmatemesis. Constipation was troublesome. Cachexia and emaciation were marked. A nodulated palpable tumour could be felt which was judged to be in the greater curvature of the stomach. The patient was transferred to a surgical ward on April 6th. Laparotomy was performed, but the mass could not be removed, nor could gastro-enterostomy be performed. The man recovered from the operation.

CASE 3.—The patient, a man, aged 48 years, was admitted to Ward 7 on April 21st, 1900, on account of vomiting, weakness, and loss of flesh of two months' duration; everything, even water, was vomited. Certainly he was well and strong three months before admission but had been liable to "water-brash" all his life and for some years had suffered from morning vomiting. There was a lump in the epigastrium which was discovered accidentally shortly before admission. The tumour was freely palpable but not painful and might be situated either in the left lobe of the liver or in the pylorus. There was no vomiting after admission but pain was troublesome in the left hypochondrium. The heart and lungs were normal. Slight albuminuria was present. On April 26th the tumour was diagnosed as gastric in situation. Operation was performed on May 18th. A tumour was found in the left lobe of the liver and another in the posterior wall of the stomach, the latter probably being primary. The wound was closed. The patient was re-admitted on June 19th. The wound was perfectly cicatrised and the nodule was still palpable in the epigastrium. The patient died on Sept. 11th from asthenia. A post-mortem examination revealed a large columnar-celled epithelioma of the stomach with secondary nodules in the liver, portal glands, and mediastinal glands.

CASE 4 —The patient, a man, aged 34 years, was admitted to Ward 7 on Jan. 24th, 1902, on acccount of dull epigastric pain of six weeks' duration in consequence of which he had had to lie up three weeks before admission. Pain was not related to taking of food and was not accompanied by vomiting. Constipation was troublesome. The tongue was flabby, indented, and tremulous. On palpation there was fulness in the epigastrium, which was very tender, but no

palpable tumour could be made out or snccnssion. The diagnosis oscillated between disease of the pylorus and disease of the gall-bladder. The heart was normal. Slight albuminuria was present. Operation (performed on Feb. 12th) revealed a large malignant tnmonr in the anterior wall of the stomach with secondary nodules in the liver. The wound was closed. He was readmitted, with the wonnd healed, on Feb. 25th, and was dismissed to his home at his own request on the 28th.

CASE 5.—The patient, a man, aged 47 years, was admitted to Ward 7 on Jan. 16th, 1903, on acconnt of severe pain in the epigastrium, frequent coffee-ground vomiting, and great emaciation (he lost almost three stones in five months), and a mass, obviously pyloric, in the epigastrium. He had been ill for 12 months in all. There was no free hydrochloric acid in the gastric contents. The red blood corpuscles numbered 3,500,000 per cubic millimetre. He was transferred to the surgical ward on Feb. 4th and a gastro-enterostomy was performed with great relief to the gastric pain and marked improvement of his general condition. He was dismissed to his home on April 13th with failing strength and œdema of the lower limbs.

CASE 6.—The patient, a man, aged 55 years, was admitted to hospital on July 31st, 1903, on account of pain after food and vomiting of a year's duration. Distinct dilatation of the stomach was present which was treated by lavage, but there was no palpable tnmonr. No free hydrochloric acid was present. A brother had died from gastric cancer. The patient was transferred to the surgical ward on Sept. 23rd and laparotomy was performed. Diffuse cancerons infiltration of the stomach wall was found. Death ensued in two days.

CASE 7.—The patient, a married woman, aged 40 years, was admitted to Ward 8 on Sept. 3rd, 1898, on account of vomiting and pain in the stomach and of rapidly advancing emaciation of about eight months' dnration. She was transferred on Sept. 7th to the surgical ward on account of the constant vomiting. The occurrence of the vomiting immediately after ingestion snggested obstruction near the cardiac end and passage of bougies confirmed this. On the 10th laparotomy was performed and a large tumour was discovered in the stomach. Enterostomy was performed and a duodenal fistnla was established. Death ensued within 48 hours. Post mortem examination revealed a large cancerons tumour of the body of the stomach ulcerating into the liver and into the small sac of the omentum.

CASE 8.—The patient, a married woman, aged 27 years, was admitted to Ward 8 on Nov. 23rd, 1898, on account of pain after food and a swelling in the epigastrium. The

epigastric tumour was first noticed after a severe attack of pain in the stomach on Nov. 17th, and the history was not that characteristic of gastric cancer. On April 22nd, 1898, she had been admitted on acconnt of chronic gastric catarrh with doubtful evidence of ulceration in the form of an obscure history of coffee-ground vomiting. She remained well till Angnst, 1898, when another attack of pain and vomiting occurred, the vomited matter being brown in colour and in quantity abont a cupful. She had similar attacks in the middle of August and in October. Since then she had snffered from constipation and a tendency to melæna. She was transferred to the surgical ward on Nov. 27th, with the view that the epigastric tumour might possibly be an abscess connected with an ulcer of the stomach. On the 29th laparotomy was performed, when a large cancerous tumour involving the pylorns with wide-spread implication of the neighbouring glands was discovered. Removal was impossible but gastro-enterostomy was performed. She recovered well from the operation and had temporary relief from her pain.

Case 9.—The patient, a married woman, aged 54 years, was admitted on Sept. 9th, 1899, to Ward 8 on account of progressive weakness and emaciation of a year's dnration and of very constant vomiting after food of six or eight months' duration. A large, very hard, painless, freely moveable, and nodulated tumour (first noticed by the patient in the previous March), evidently involving the pylorus and the greater curvature of the stomach, was easily palpable. For the relief of the vomiting she was transferred to the surgical ward on Sept. 19th, where gastro-enterostomy was performed, with immediate relief of the vomiting. The patient died from asthenia on Oct. 11th and a post-mortem examination held on the 13th revealed a perfectly formed artificial pylorus, as well as a large epithelioma of the pylorus, extending towards the cardiac end and also towards the opening into the jejunum. Secondary tumours were found in the left lung and pleura but none in thc liver.

Case 10.—The patient, a married woman, aged 55 years, was admitted on Sept. 27th, 1901, to Ward 8, on account of vomiting of food occasionally for four years and of loss of flesh of one month's duration. A hard mass, evidently pyloric in situation, could be felt in the epigastrium and striking gastric peristalsis was visible. Vomiting and constipation had persisted for four years. Two years previously an attack of scvere pain in the stomach had occurred, followed on the next day by hæmatemesis (coffee ground) and tarry motions ; ulcer was then diagnoscd. Thc hæmatemesis was not repeated but for two years shc had vomited two or three times a wcek, the ejecta appearing to bc greater than the ingesta. Emaciation only began a month bcfore

admission but for four months she had suffered from an uneasy "rumbling" in the stomach. She was transferred to the surgical ward on Oct. 1st for gastro-enterostomy but pylorectomy was performed as conditions seemed favourable when the abdomen was opened. The patient died the same day.

CASE 11.—The patient, a married woman, aged 57 years, was admitted on April 11th, 1902, and was transferred to the surgical ward on the 23rd. Pylorectomy was performed a few days later and death occurred on the same day. The following is a clinical summary of the case. "Tumour of the pylorus with considerable dilatation of the stomach. Palpable mobile tumour and visible gastric peristalsis. Duration of at least a year since a sudden attack of faintness and melæna in May, 1901; condition much worse the last four months, during which she had frequent vomiting attacks. Vomitus like that of gastric dilatation, with a minute trace of free hydrochloric acid but no free lactic acid. Bowels constipated but respond to aperients. Liver apparently free, though right extremity of the tumour may be adherent to its under surface. Very free mobility of the tumour as a whole." On April 15th I concluded a long clinical note in the ward journal with the following sentence: "Pyloric obstruction, though great, is not complete, and emaciation, though considerable, is not extremely advanced. Pylorectomy does not seem from the medical aspect to be indicated but gastro-enterostomy certainly promises considerable relief." On opening the abdomen the conditions for a radical operation seemed so favourable that pylorectomy was performed.

CASE 12.—The patient, a married woman, aged 42 years, was admitted to Ward 8 on Nov. 4th, 1902, on account of vomiting, constipation, emaciation, and a "lump" in the epigastrium associated with visible peristalsis. No hæmatemesis was present. The stomach symptoms had been troublesome for 15 years and were greatly aggravated since the previous January. In August she was seen in consultation and gastro-enterostomy was advised. On Nov. 7th no free hydrochloric acid was discovered in the gastric contents. Gastro-enterostomy was successfully performed on the 15th. The patient died at home on Dec. 29th.

CASE 13.—The patient, a married woman, aged 44 years, was admitted to Ward 8 on Nov. 17th, 1902, on account of stomach symptoms which were observed for the first time in June, 1902. She had been in residence in the preceding May for acute rheumatism and systolic murmur at the apex, when certainly no stomach symptoms were complained of. Since then she had been liable to vomiting every three or four days and emaciation had begun. On admission a large, palpable, freely moveable nodule was presented in the

epigastrium with marked visible peristalsis. No free hydrochloric acid or lactic acid was detected in the gastric contents. The liver was not enlarged. The patient was transferred to a surgical ward on Nov. 25th. Gastro-enterostomy was performed on the 29th and she was dismissed on Jan. 16th, 1903, feeling well and having gained in weight. She died from asthenia a short time afterwards on Feb. 24th. Post-mortem examination revealed a pyloric cancer undergoing colloid change with numerous secondary peritoneal nodules. The local results of the operation were perfect.

Ruptured Gastric Ulcer.

Of the great value of early operation in cases of ruptured gastric ulcer as a means of saving life there can be no doubt whatever and this can with the greatest certainty be affirmed in spite of the extremely fatal results in the four cases operated upon in the present series of cases. Three of the four patients died shortly after the operation was performed. The fourth made a very good recovery but in this case no ulcer was discovered at the operation. When we consider the large number of cases of disease of the stomach of all kinds (220) treated in the medical wards under my care during the period at present under review it must be admitted that four cases presenting symptoms of a ruptured ulcer constitute a relatively small proportion. It must be remembered, however, that under present conditions cases of ruptured gastric ulcer are on the whole more likely to make their way directly into the surgical wards and so are not so liable to come under the observation of the hospital physician in the first instance. I propose now to give a short summary of the four cases in which operation was recommended and undertaken for the relief of ruptured gastric ulcer.

Epitome of Cases of Ruptured Gastric Ulcer.

Case 1.—The patient, a female, aged 18 years, was admitted under my care on Nov. 24th, 1902, complaining of gastric pain, vomiting, and headache of three weeks' duration. The pain was localised, stabbing in character, but did not penetrate to the back. It had been continuous for three weeks and was always aggravated by food, even strict milk diet. Vomiting occurred about one hour after food and gave little or no relief. There was no history of hæmatemesis. On admission she was emaciated and slightly anæmic. Examination of the abdomen revealed distinct tenderness in a small area midway between the xiphoid and the umbilicus. There was no sign of dilatation of the stomach. The vertical diameter of the hepatic dulness measured two and a half inches in the mid-clavicular and three inches in the mid-axillary line. She was kept in bed and small quantities of milk were administered frequently. At 8 P.M. on the 27th she complained of an acute epigastric pain going through to

her back. The onset was sudden and a few minutes later she vomited three ounces of curdled milk with several bright red blood-clots in it. The abdomen on inspection appeared to be normal. Sharp epigastric tenderness was elicited and there was also slight tenderness in the right hypochondriac and right lumbar regions. The liver dulness was normal. The temperature was 98° F. and the pulse was 60 per minute, regular, and of good tension; the respirations were normal. Under the influence of heat the pain disappeared in the course of 40 minutes and she had a good night. At 8 30 A M. on the 28th the epigastric pain again became so severe that the patient was forced to cry out. When seen at 9 A.M. her face was pale and her expression was anxious. On inspection the abdomen seemed to be normal and abdominal respiration was present. Epigastric tenderness was very acute and the anterior abdominal wall was slightly rigid. At this examination the area of liver dulness was found to be almost absent, only a narrow band about half an inch in vertical diameter remaining. The temperature had fallen to 96 6°; the pulse was 112, small, but of fair tension; and the respirations were 28 per minute. After consultation with Dr. W. K. Hunter I requested my colleague Mr. J. Hogarth Pringle to see the patient and after further consultation it was determined that as the case was probably one of perforation of the stomach by a gastric ulcer laparotomy should be performed at once. On opening the abdomen there was no sign of peritonitis. The stomach was normal in size and position and no abnormality was noted in its wall. The colon was distinctly contracted and appeared about one inch in diameter. After the operation the patient made good progress for three weeks and then for a few days slight hæmatemesis recurred. At the end of another three weeks she was dismissed well, the area of liver dulness at this time being much diminished. As she did not return to report herself she has not been again examined.

CASE 2.—The patient, a married woman, an Italian, aged 28 years, was admitted to Ward 8 on April 25th, 1902. As neither the patient nor her friends could speak English no accurate clinical history could be obtained. I saw her on the morning of April 26th and found her dangerously ill. The physical signs indicated that she was suffering from acute peritonitis limited to the epigastric, upper umbilical, and right lumbar regions. In this area of the abdomen visible bulging was present and there was slight œdema of the skin over the lower sternal and right costal margins. On palpation a distinct resistance and an ill-defined infiltration were found occupying the area just mentioned. Percussion over the distended area was distinctly dull and there was tenderness on palpation, most marked just above and slightly to the right of the umbilicus. The pulse was small, thready, and regular, numbering 130; the tongue was dry and coated

with a brown fur ; the stomach was very irritable and there was constant bilious vomiting. As I thought the symptoms were probably due to a ruptured gastric ulcer she was removed at once to the surgical ward and laparotomy was performed. No gastric ulcer or localised abscess could be found. The liver was very greatly enlarged and apparently fatty. The patient died five hours later and no post-mortem examination could be obtained.

Case 3.—The patient, a female, aged 21 years, single, was admitted to Ward 8 under the care of my *chef de clinique* Dr. Hunter during my absence on holiday on August 4th, 1901 ; she was transferred to the surgical ward on the same day and died at 7 P.M. She was admitted to the ward at 3 A.M., complaining of pain in the abdomen of eight hours' duration. For two months before this she had been complaining of pain in the stomach setting in from half an hour to an hour after food but there had been no vomiting before the day of admission. On the day before admission, about 7 P.M., she was suddenly seized with severe pain in the abdomen, accompanied by pale lividity of the countenance. A medical man who was called ordered fomentations. He was summoned again and found her doubled up with pain, the knees being drawn up on the abdomen. He ordered her removal to the infirmary. At the time of admission she was on the whole better ; the pulse numbered 100 and was small, the temperature was 99° F., and she vomited a little bile only on one occasion. Dr. Hunter saw her at 12 noon on the 4th and advised immediate operation. On opening the abdomen bile-stained fluid was found in the peritoneal cavity as well as a perforation in the stomach wall large enough to admit a goose-quill and situated on the anterior surface one and a half inches above the great curvature and slightly to the left of the middle line. The rupture was sutured. A post-mortem examination verified the state of matters found on operation.

Case 4.—The patient, a female, aged 25 years, single, was admitted to Ward 8 on Sept. 6th, 1900, under the care of Dr. Hunter, and transferred to the surgical ward for operation on the 7th. She had suffered from dyspepsia for eight years and had been under treatment before admission since Sept. 4th for peritonitis. On opening the abdomen a ruptured ulcer and a localised peritonitis were discovered. The post-mortem summary was in the the following terms: "Gastric ulcer ; rupture of stomach ; ulcer sutured."

The foregoing list, unsuccessful as the cases were, is not without important lessons. In the surgical treatment of ruptured gastric ulcer time is a factor of the very highest moment. The earlier a rupture is recognised and operation undertaken the better the results of the operation are likely to be. In this connexion I may refer to two cases

which I recorded in the *Glasgow Medical Journal* in 1899 and in which the precise time from the occurrence of the perforation to the development of a fatal general peritonitis could be estimated with probable accuracy. In one, a case of duodenal ulcer, death occurred 21 honrs, and in the other, a case of gastric ulcer, 25 honrs after the occurrence of perforation. In neither case was an operation performed. In both the actual time of perforation could be accurately fixed and in both a most intense general peritonitis, with escape of the gastric contents into the cavity of the peritoneum, was discovered on post-mortem examination. Of course the situation of the perforation varies in different cases. In some the perforation may be so situated that only a localised peritonitis with subsequent abscess formation may result. In others the rupture may lead to the escape of the contents of the stomach directly into the cavity of the peritoneum, as in the two cases to which I have just referred. In the former class of case we may perhaps, and sometimes possibly with advantage, be able to wait and watch before resorting to surgical interference ; but in the latter class we must advise operation at the very earliest moment if we are to have any chance of saving the life of the patient. In either class of case, however, the clinical skill and acumen of the physician will be taxed to the uttermost.

Before concluding this section of my paper I should like briefly to refer to two methods of diagnosis which have been much practised in dealing with cases of ruptured gastric ulcer. *First, with regard to the area of hepatic dulness*, it has been pointed out by a number of observers that in many cases of rupture of the stomach the area of hepatic dulness rapidly disappears. In the first of our list of cases the hepatic area was found to be greatly diminished in size and this formed one of the factors which led to onr advising an operation. As we have seen, no ulcer was found in the case and the patient recovered well. Personally I do not think that we can place much reliance upon this physical sign and I would refer von to a communication by my former house physician, Dr. W. G. Rodger, in which he gives the results of his investigations on this matter in six cases, five of which were from my wards and one from the wards of my colleague, Dr. J. W. Allan.[3] *Seeondly, with regard to leucocytosis*, I am inclined to think that the development of a rapid leucocytosis would be a valuable indication in our efforts at diagnosis and I think a blood count should be made in all cases. The leucocytosis may not indicate a general peritonitis bnt its presence would probably point to pns formation and so it may be a valuable guide as to whether operation should be nndertaken or not. In one of the cases reported by Dr. Rodger where there was a duodenal ulcer perforating the pancreas but withont causing peritonitis the

[3] The Lancet, July 11th, 1903, p. 98.

leucocyte count rose from 5250 at 2 A.M. to 25,600 per cubic millimetre at 9 A.M.

Hæmatemesis.

There is perhaps no affection of the stomach the treatment of which causes the physician more anxiety than that which is accompanied by copious vomiting of blood. Hæmatemesis due to gastric disease may be of two kinds: it may be due (1) to a more or less continuous oozing from a simple or malignant ulcerated surface, in which case the vomited matter is usually of the "coffee-ground" character, or it may be caused (2) by the perforation of a comparatively large branch of one of the gastric arteries, in which case the blood vomited may be quite fluid or in the form of bright red clots. (With the copious hæmorrhage which sometimes complicates hepatic cirrhosis or is caused by varix of the œsophagus we are not at present concerned.) In cases of hæmatemesis due to arterial perforation copious tarry motions are common and in some almost as much blood may pass down into the intestine as is evacuated by the mouth. Such severe hæmorrhage may occur during the progress of a simple perforating ulcer or more rarely as the result of a "pore-like" erosion of the wall of one of the larger branches of the gastric arteries (exulceratio simplex of Dieulafoy[4]) without any marked ulceration of the surrounding mucous membrane and at most accompanied by an abrasion so slight in area and degree that the lesion might readily enough be overlooked even at the necropsy. Very severe hæmorrhages occurring in the course of Cruveilhier's perforating ulcer are not infrequently quite recovered from under ordinary medicinal treatment but the chance of recovery in a well-marked case of "pore-like" erosion of the gastric arteries is, I should think, very slight unless, indeed, the surgeon can ligature the bleeding point. Fenwick divides hæmorrhage from chronic ulcer of the stomach into three varieties: (1) slight hæmorrhage; (2) moderate hæmorrhage; and (3) excessive hæmorrhage (l'hémorragie foudroyante). Now in cases of "pore-like" erosion the bleeding is usually of the "foudroyante" variety and this variety of bleeding, according to the same authority, is rare, being only observed in 3·4 per cent. of the cases examined.[5] In some of such cases the source of the hæmorrhage may be, and I think probably has been, overlooked even on the post-mortem table and the bleeding has been erroneously ascribed to congestion and diapedesis. I have met with two such cases, confirmed by necropsy, which I have already published.[6] In one of the cases the hæmorrhage might be

[4] Manuel de Pathologie Interne, thirteenth edition, tome ii., p. 281, Paris, 1901.

[5] Ulcer of the Stomach and Duodenum, London, 1900, p. 195.

[6] Transactions of the Medico-Chirurgical Society of Glasgow, vol. ii. p. 238, 1900; also Glasgow Medical Journal, 1899.

described as severe if not excessive and in the other as "fondroyante." The first died exhausted from a diarrhœa which set in after the hæmorrhage had been arrested and the second died on the fonrth day of residence, dnring which he had vomited 96 ounces of blood in addition to profnse tarry motions, and exclusive of a profuse hæmatemesis before admission which had caused him to fall fainting in the street, and which an ambnlance attendant who picked him np and brought him to the infirmary estimated at from two to three pints. In this case I asked my colleague Mr. J. Hogarth Pringle to open the stomach after all available medicinal means had failed but he was nnable to find the source of the bleeding.

In "pore like" erosion of the gastric arteries an important point in the diagnosis is the absolnte suddenness with which in many cases the hæmorrhage sets in, and often withont any previons history of gastric disorder. In one of the two cases noted above the attack came on in the midst of apparent health, and in the other the longest clinical history of stomach symptoms that could be obtained was one of four weeks. I believe, however, that I have seen a third case which was more striking than either of these two but in which the diagnosis conld not be confirmed by post-mortem examination. The patient was a robust stont man of middle age, whom I saw on May 1st, 1901, in consnltation with his medical man, Dr. J. N. Glaister of Glasgow. On the morning of that day in the midst of good health and the active discharge of his daily duties, and without any clinical history of previons gastric disturbance except an occasional attack of dyspepsia, he was suddenly seized after a hearty breakfast with a profuse hæmatemesis. This had continued all day in spite of careful treatment and I was called to see him at midnight. I found him exsangnine and collapsed, and with a bowlful of bright red blood at his bedside which he had just vomited. Nothing further could be done and he died early the next day. I have no doubt in my own mind that this was a case of "pore-like" erosion or "exulceratio simplex" of Dieulafoy.

Now, in all cases of severe hæmatemesis due to organic disease of the stomach, whether caused by simple nlcer or by "pore-like" erosion, I am of opinion that the propriety of calling in surgical help should from the first be carefully considered by the physician, particularly if profuse bleeding is repeated at short intervals and the life of the patient is threatened from collapse. In cases where there is a clear history of chronic ulcer I think medical treatment may be pnrsued for a time with fair prospects of snccess in many even severe cases, but in cases of "pore-like" erosion where the "foudroyante" type of bleeding starts with appalling suddenness the sooner the snrgeon is called the better. Dieulafoy has recorded one brilliant success, the life of a patient threatened by profnse hæmorrhage from "exulceratio simplex" being saved by immediate operation ; and such records are always

encouraging. In severe hæmorrhage from simple ulcer the operation should be easier as the site of the ulcer would serve as a guide to the bleeding point, but in "pore-like" erosion it may be exceedingly difficult to find the bleeding point after the stomach is opened. Nevertheless, the attempt should be made. In the case of ulcer, too, the presence of deep-seated adhesions or the situation of the ulcer may give rise to difficulties not easy to overcome. In spite of it all, however, our only hope in many of these cases is in the surgeon.

Epitome of Cases of Hæmatemesis.

CASE 1. *Severe hæmatemesis from a simple ulcer of the stomach, in which the stomach was opened and the edges of the ulcer were brought together by sutures* —The patient was a man, aged 46 years, who had been suffering from anorexia, pain after food, and frequent vomiting for five months before admission. He had had three separate attacks of severe hæmatemesis—the first in July, 1899, the third on Oct. 1st of the same year, the day before his admission to the infirmary. He was very weak and greatly emaciated. As he was very willing to have something done which might prevent the recurrence of the bleeding he was transferred to the surgical ward on Oct. 5th. I was of opinion that the bleeding was from an ulcer and not from a "pore-like" erosion. After his transference the bleeding ceased and nothing was done. On the 15th it recurred with great severity. I saw him in the evening in consultation with Mr. James Luke, who was acting for my colleague Mr. Pringle and we agreed that operation should be performed at once. A simple ulcer was found, the wall at the site of the ulcer being adherent to the liver; its edges were brought together by sutures after the surface had been scraped by a Volkmann's spoon. The patient recovered from the chloroform but died a few hours afterwards from exhaustion.

CASE 2.—This was a case of profuse hæmatemesis due to "pore-like" erosion of a branch of the left gastro-epiploic artery. Laparotomy and exploration of the interior of the stomach were performed by Mr. Pringle. 96 ounces of blood were vomited during four days' residence. Profuse tarry motions were passed. Death occurred one and a half hours after operation. This case has been sufficiently referred to above and has already been published in detail.[7]

DILATATION OF THE STOMACH.

There is, perhaps, no affection of the stomach which in well-selected cases may be more successfully treated by the

[7] Transactions of the Medico-Chirurgical Society of Glasgow, 1900, vol. ii., p. 242; also Author's Lectures on Clinical Medicine, Glasgow, 1900, p. 180.

surgeon than that of simple dilatation of the organ. I mean by this dilatation which is produced by other causes than by malignant disease. As we have already seen, even in dilatation due to malignant disease, the operation of gastro-enterostomy may afford great temporary relief from severe suffering, but in the affections with which I am now dealing, we may, in certain cases, hope for much more permanent benefit if not for absolute cure.

Simple dilatation of the stomach may arise, I think, in several different ways. It may be caused by the cicatricial contraction of the pylorus arising from the healing of a simple ulcer at or in the immediate neighbourhood of the orifice. It may be caused by peritoneal adhesions binding the pylorus to the under surface of the liver in the region of the gall-bladder. Or it may arise from an atonic relaxation of the coats of the stomach the result of chronic catarrh due to long continued errors of diet and overloading of the viscus. In such cases there may be no actual narrowing of the pylorus itself. In a few cases the dilatation may be due to what can only be regarded as a congenital narrowing of the pyloric opening. Now in all such cases when medical treatment has been fairly tried and has failed, we may with the greatest confidence appeal to the surgeon for help. It is always right that medical and dietetic treatment should be given a thorough trial before resorting to operation, because it must be admitted that in a certain number of cases, more especially those which are of the atonic variety and due to errors of diet, a cure may be effected by such treatment. A cure by medical means must always be preferable, for, however successful the operation, there must ever be the risk of a cicatrix yielding and giving rise to hernia, or of obstructive complications arising from the dislocation of normal relationships which is necessarily involved in any surgical procedure. There is also, I think, some danger of the artificial opening contracting somewhat in the course of time, but this is not so likely to happen in cases where there is a decided stenosis of the pylorus. There can be little doubt that gastro enterostomy is the operation to be preferred in all such cases, and when medicine has entirely failed surgery must be resorted to. My experience of this method of treatment is limited to four cases, three in hospital and one in private practice, and in all the results were most satisfactory.

Epitome of Cases of Dilatation of the Stomach.

Case 1.—The patient, a man, aged 30 years, was admitted to Ward 7 for the first time on May 22nd, 1899, and was dismissed very greatly improved about two months later, on July 25th. On admission he was suffering from dilatation of the stomach and hæmorrhage into its cavity and into the intestinal canal. Except for well-marked Hippocratic succussion and a slight enlargement of the left lobe of the liver

physical examination gave negative results. The washings of the stomach contained altered blood and anæmia was very profound. On May 29th the hæmoglobin was 20 per cent. and red blood corpuscles numbered 1,380,000 per cubic millimetre. The evening temperature often reached 101° or 102°F. The heart and lungs were normal. The illness dated from Jan. 1st, and was characterised by pain in the epigastrium and beneath the left shoulder after food, by frequent vomiting, and by progressive weakness, so that he had been quite unable to work since March. He was treated by rest, rectal feeding, and lavage of the stomach. At the time of dismissal he was very well. The hæmoglobin was 60 per cent. and the red blood corpuscles numbered 4,560,000 per cubic millimetre. The patient was readmitted to Ward 12 on May 6th, 1901, and transferred to the surgical ward on June 10th when gastro-enterostomy was performed on the 13th by Mr. Pringle. After his previous residence he had remained very well till March, 1901, when as the result of a chill his gastric symptoms again became very urgent. Succussion revealed very great dilatation and constipation was extreme. The operation was very successful. He made an uninterrupted recovery and left the infirmary on August 2nd, 1901, quite well Several attempts have been made to find him at various addresses since then but have failed.

Case 2.—The patient, a man, aged 40 years, was admitted to Ward 7 for the first time on Dec. 22nd, 1900, and dismissed, on account of family reasons, on Jan. 5th, 1901, greatly improved. On this occasion he was suffering from subacute gastric catarrh with considerable dilatation of the stomach, the symptoms having been present for about 13 weeks and consisting chiefly of pain in the epigastrium followed by vomiting Except for moderate dilatation no evidence of serious organic disease could be detected. The heart and lungs were normal and the urine, at first slightly albuminous, soon presented healthy characters. The patient was readmitted on April 28th, 1902, with all the signs and symptoms of great atonic dilatation of the stomach. No tumour could be detected and there was no specially painful area. He was transferred to the surgical ward on May 19th and the operation of gastro-enterostomy was successfully performed by Mr. Pringle. The following letter from his medical attendant (Dr. J. W. Little of Newmains) shows his condition at the present time: "I have been asked by Mr. —— to reply to your letter of Feb. 9th and state that he has enjoyed quite exceptional health since the operation, never having missed his daily work since, nor has he had any stomach symptoms and can take all kinds of food with impunity. He also intends to visit you at the infirmary on Saturday between 9 and 11 o'clock." I saw the patient on Feb. 13th, 1904, and found him in all respects perfectly well and the cicatrix firm and strong.

CASE 3.—The patient, a man, aged 40 years, a miner, was recently readmitted for the second time to Ward 7 on Dec. 12th, 1903, on acconnt of vomiting after food and general nervous debility. He was dismissed towards the end of Jannary, 1904, having maintained fair health and a good appetite, except for a few days when he had some vomiting. The following summary of the rather extensive clinical notes is all that need be given here. Gastro-enterostomy was performed in June, 1902, on acconnt of dilatation of the stomach, associated with vomiting, nervonsness, and debility of at least three years' duration. He had been in previous residence from Jan. 27th to March 18th, 1899. He was then suffering chiefly from catarrh of the stomach. Af·er leaving the hospital he was treated as an ont-patient of the wards for stomach symptoms, with gradnally advancing dilatation, till Jnne, 1902, when he was readmitted for the purpose of having gastro-enterostomy performed. Since then, although enjoying fair health on the whole, he has been liable to occasional attacks of vomiting, the last severe attack having occurred in November, 1903 The result in this case has not been so good as in the other two cases, but this may partly be accounted for by the fact that his nervous system has been weakened by a severe crushing accident six or seven years ago which has permanently crippled his right leg and prevented him following his ordinary occnpation.

The last of the 23 operations on the stomach which have formed the basis of this paper—viz., gastrostomy for cancerons stricture of the œsophagns—need not be considered in detail, as the disease does not involve the stomach and so hardly comes within the scope of my present snbject.

In what has gone before I think I have clearly shown that, with careful selection, there are many affections of the stomach which may be most beneficially and successfnlly treated by snrgical operation. As regards malignant disease I fear that in the meantime at least the resnlts of surgical interference will be mainly palliative. In cases of rnptnred ulcer, of excessive hæmatemesis and of dilatation we may in many cases confidently expect, not only the immediate saving of life, but a permanent cure of the malady as the result of operation. To my snrgical colleagnes, Mr. J. Hogarth Pringle, F.R.C.S. Eng., by whom the majority of the operations here recorded were performed, and Mr. Luke, who acted in his chief's absence, I must, in conclusion, express my gratitude, not only for the great skill which they displayed in the performance of these delicate and difficnlt snrgical procednres, but also for the invaluable help which they so readily afforded me in the preceding study and examination of the cases for purposes of diagnosis.

Glasgow.

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